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# Exploring low subjective well-being among children aged 11 in the UK: An analysis using data reported by parents and by children

Gwyther Rees & Jonathan Bradshaw

**Abstract** If we cannot explain the factors that affect the subjective well-being of children we cannot know what to do to improve it. Comparative studies have found that children in some countries have higher mean levels of subjective well-being than children in other countries. But studies of variations in subjective well-being of children within countries, based on school based surveys of children, have failed to explain much of the variation in subjective well-being observed. This may be because such surveys can only collect limited data on their household and school from the child. Wave 5 of the UK Millennium Cohort Survey (eleven-year-olds) presents a new opportunity to understand the factors affecting children's subjective well-being making use of information gathered from parents as well as children. This article aims to identify factors which can predict the likelihood of children having low subjective well-being. The key findings from the analysis are that (a) a wide range of parent-reported variables have some power in predicting low child subjective well-being; (b) in comparison a small selection of child-reported variables have more explanatory power. Factors such as material deprivation, family financial strain, parental well-being and children's experience of being bullied emerge as important in the analysis. The implications for future research on child subjective well-being are discussed.

**Keywords** Subjective well-being · Child well-being · Life satisfaction · Positive affect · Negative affect · Happiness · Sadness

## 1 Background

### 1.1 The growing interest in subjective well-being

The observation (Easterlin, 1974; Layard, 2005) that as societies get richer beyond a certain level the happiness of their populations does not improve, has resulted in increased interest in indicators of well-being apart from income and Gross Domestic Product.

Over the last few years the idea of measuring subjective well-being (SWB) has attracted growing interest. The Stiglitz Commission (Stiglitz et al., 2009) recommended the use of subjective indicators as a measure of social progress. The OECD (2009) has begun to publish the *Better Life Index*, now *How's Life for Children* (OECD, 2015), including comparisons of life satisfaction. A series of annual World Happiness Reports have also been published (Helliwell et al., 2013; 2014, 2015). In the UK, the Office for National Statistics has been developing a programme of national well-being measurement which includes both objective and subjective indicators (ONS, 2014).

In relation to children, a number of national studies have been undertaken (see section 1.3). At an international level, the Health Behaviour in School-aged Children includes a measure

of life satisfaction (Currie et al., 2012); and the Children's Worlds study has begun to accumulate information from children about their lives and well-being across a diverse set of countries around the world (Rees & Main, 2015; Rees, Andresen & Bradshaw, 2016).

## **1.2 Conceptualising and measuring subjective well-being**

The Stiglitz Commission (Stiglitz et al., 2009) drew up a set of proposed domains for representing well-being including quality of life or SWB. This was understood by them as comprising three components – life satisfaction (*'a person's overall judgement about their life at a particular point in time'*), positive affect (e.g. feelings of happiness, joy, vitality) and negative affect (e.g. feelings of sadness, anger or depression). This approach reflects the most common framework used in the SWB literature (Diener, 1984) which divides the concept into a cognitive component (life satisfaction and satisfaction with particular aspects of life) and an affective component (comprising two sub-components – positive affect and negative affect). It is argued that the cognitive component is more stable than the affective component, and studies of adult populations have generally supported this proposition (Eid and Diener, 2004).

While this framework is commonly cited at a conceptual level, most empirical work on SWB has tended to focus on the cognitive component – in particular measuring people's satisfaction with life as a whole. There has been less exploration of positive and negative affect, and this applies both to research with adult and child populations.

Measures of SWB typically utilise response scales either ranging from 'completely dissatisfied' to 'completely satisfied' (bipolar) or from 'not at all satisfied' to 'completely satisfied'. It has become common to use 11-point (0 to 10) response scales but some studies still use shorter scales. While, multi-item scales have been developed such as the Satisfaction with Life scale for adults (Diener et al., 1985) and the Student Life Satisfaction Scale for children (Huebner, 1991), it is also still common for analysis to be based on single-item measures – typically asking about satisfaction with life as a whole. Single-item scales are likely to be less temporally stable than multi-item scales (Diener et al., 2013) and may be more suitable for comparison of large-scale aggregate scores, such as for international comparative research, than for studies of individual variation.

An important issue from a policy perspective is to consider which metric to use to assess variations. It is common to focus on mean SWB scores but arguments can also be made to consider measures of inequality in SWB (such as standard deviations) or the proportion of people with low SWB (defined by some cut-off point within the measure used). The choice between these metrics can relate to practical goals. It may be argued that the goal should be to increase average SWB; to minimise inequality in SWB; or to minimise misery (i.e. low SWB). This may bring different factors to the fore, but most analysis to date has been based on mean SWB scores and there is a shortage of research which considers the relative merits and implications of these different approaches.

## **1.3 Explaining variations in children's subjective well-being**

Analysis of the international data shows that there is variation between countries in terms of mean levels of SWB. For adult populations, Helliwell et al. (2015) present analysis which indicates that 74% of the variation in SWB between countries can be explained by six factors

– GDP per capita, social support, healthy life expectancy, freedom to make life choices, generosity of giving and perceptions of corruption. For child populations, Bradshaw et al. (2013) have shown an association between objective measures and SWB at the country level within European countries. However, analysis of a more diverse set of countries (Bradshaw & Rees, 2016, forthcoming) has found relatively little association between many traditional indicators such as, adult life satisfaction, GDP per capita, education spending, female employment rates, inequality and youth employment and mean SWB across countries. It is also clear that most of the variation in child SWB occurs within countries rather than between countries (Lee & Yoo, 2015).

Regarding variations between individual children within countries, using the micro-level individual data from the HBSC (Klocke et al 2014) found that children's age and gender explained 8% of the variation in mean SWB, adding parental employment status and family affluence increased this to 12% and adding some child reported behaviours, including experience of bullying increased this to 23%. National surveys of samples of children have typically succeeded in explaining similar amounts of the variation in SWB. For example in England, Goswami (2014) found that socio-demographic factors explained around 15% of the variation in the mean SWB of children aged 10 to 15 and personality explained around a further 18% - thus the two sets of factors combined explained around a third of the total variation. Factors such as children's evaluations of the quality of family relationships also explain substantial amounts of the variation in their SWB but it is not yet entirely clear to what extent these types of variables lie outside and are independent of the concept of SWB.

Thus while some progress has been made in understanding variations in child SWB at the macro and the micro level, there is still a substantial amount of variation left unexplained. If we cannot fully explain variations in children's SWB how can we seek to improve it? How can we aspire to have higher levels of SWB of children if we don't know how to achieve it (Bradshaw 2015)?

One possible reason why we have not made more progress in understanding variation in SWB is that schools-based surveys are only able to collect a limited range of the data that might be relevant, and usually can only gather data from the child. For example little information can be collected on the employment status, income, health and other circumstances of parents. Studies which are able to analyse data from children and parents in combination are rare in the literature on children's SWB.

Wave 5 of the UK Millennium Cohort Survey (MCS) (undertaken when children were around 11 years old) presents a new opportunity to understand better the variation in children's SWB. This survey is the first time data on child SWB has been collected in a British birth cohort study. It is a very large sample (over 13,000 children remain in the sample at Wave 5) with data collected on the child, parents, family, household and school from three sources – the child, their parents/carers and teachers.

#### **1.4 Research questions**

This article presents analysis of the MCS Wave 5 data set which aims to explore which factors reported by parents and children predict low SWB of children in the UK at the age of 11 years old. This is the first such analysis of this data and the information reported by

parents means that this analysis has the potential to make an important new contribution to the literature on understanding the factors affecting children's SWB.

## **2 Methods and data**

### **2.1 The Millennium Cohort Study**

The Millennium Cohort Study is a birth cohort study that tracks a sample of children born around the turn of the millennium in the UK. So far, five waves of data collection have been completed – when the children were around nine months old and around three, five, seven and 11 years old. A sixth wave (around the age of 14) has recently been completed but data is not yet available.

The initial sample consisted of over 18,000 children. The sample is stratified to over-represent ethnic minorities and poor families for the purposes of sub-group analysis.

Weightings and other sample design information are available to balance the sample to be representative of the general population and also to take account of sample attrition. At Wave 5, there were still over 13,000 children in the survey. The analysis includes almost all of these children but excludes a small number of second and third born twins and triplets in order to avoid the effects of clustering within families.

### **2.2 Measures of subjective well-being**

Wave 5 included a child self-report questionnaire and, along with a range of other topics, this contained two sets of questions which tap into the components of SWB discussed earlier. The first set consisted of six questions regarding how children felt about different parts of their life – school work, appearance, family, friends, school and life as a whole. These items used a seven-point scale labelled with '1' labelled as 'Completely happy' and '7' labelled as 'Not at all happy'. Because these questions ask children to make evaluative judgements about their lives we view these as representing the cognitive component of SWB. The second set of six questions asked children to say how often in the last four weeks they had felt happy, worried, sad, afraid or scared, had laughed and had got angry. These questions used a five-point scale labelled 'Never', 'Almost never', 'Sometimes', 'Often' and 'Almost always'. Because these questions referred to a relatively short time scale and focused on emotions and feelings we view these as representing the affective component of SWB.

An exploratory factor analysis of these 12 questions (using Principal Axis Factoring with Direct Oblimin rotation and a cut-off point of eigen-values greater than one) extracted three factors which explained 58% of the variation. The six cognitive SWB questions loaded onto the first factor, the four negative affect questions loaded onto the second factor and the two positive affect questions loaded onto the third factor. There were no cross-loadings with coefficients greater than 0.2. This exploratory analysis therefore supported the framework of cognitive, positive affective and negative affective components of SWB.

Reliability analyses were undertaken of the items within each component. For the six cognitive items, Cronbach's alpha was 0.835. For the four negative affect items Cronbach's alpha was 0.749. However there were only two positive affect items available and the Cronbach's alpha for these two items was 0.388.

A further consideration was the composition of the six cognitive SWB items. These six items have been summed to form a scale in previous analysis of UK longitudinal panel data (Clarke et al., 2000; Bradshaw & Keung, 2011). However the topics covered by the six items are limited in that not all domains that are important to the SWB of children (The Children's Society 2012) are included. For example, money and possessions, health, time use, autonomy and expectations of the future, are absent. In addition there is double weight given to school factors through the inclusion of two questions and a regression analysis indicated that these items contributed least to overall life satisfaction. There is also a conceptual issue that satisfaction with life as a whole is viewed as being the product of happiness with different aspects of life and so is a different order variable representing domains already in the scale and some that are not. Furthermore, some testing of this set of items which we undertook using confirmatory factor analysis (the results of which will be published separately) indicates that a single-factor model based on the six items does not reach acceptable levels of fit.

Taking the above factors into account we made the decision to restrict our analysis to three single-item measures – happiness with life as a whole, feelings of recent happiness and feelings of recent sadness – as these seemed the best available single items to represent the three SWB components. We refer to these variables as life satisfaction, happiness and sadness respectively. Distributions and descriptive statistics for these three SWB variables are shown in Table 1. The distributions are highly negatively skewed and tend to peak near or at the top of the scale, which is fairly typical for measures of children's SWB. Levels of missing data were below 10% for all variables. Missing cases were significantly more likely to relate to boys than girls and had a lower average household income than non-missing cases.

INSERT TABLE 1 AROUND HERE

Due to the small number of response categories for the questions it is not statistically acceptable to treat the variables as being continuous; and in addition the shape of distributions indicates that they are far from normally distributed. So we decided to create binary variables to represent low and high SWB. Apart from statistical issues there are also good practical reasons to do this – from a policy viewpoint it may be regarded as more important to lift people out of low SWB than to increase the SWB of people who are already relatively satisfied or happy.

Previous research in the UK using more sophisticated measures (The Children's Society, 2012) has indicated that around 8% to 10% of children have low SWB at any given point in time, so we sought to identify cut-off points that most closely matched this pattern. This meant counting scores as 'low SWB' if the child scored above 3 for life satisfaction, less than 'often' for recent happiness and more than 'sometimes' for recent sadness. On this basis, in the weighted sample, 12.4% of children had low life satisfaction, 17.2% had low recent happiness and 7.3% had high recent sadness.

## **2.3 Independent variables**

The MCS data set contains several thousand variables based on information gathered from parents. However, many of these variables are highly specific – for example, there are over

400 variables exploring the details of the main parent's recent employment history. In order to make decisions about which variables to select we reviewed previous similar studies using the MCS which have explored the links between a range of background factors in children's lives and outcomes such as psychopathology (Flouri, Tsavidis & Kallis, 2010); emotional/behavioural adjustment (Flouri, Midouhas & Ruddy, 2016); cognitive and behavioural development (Sabates & Dex, 2015; Dickerson & Pople, 2016); and educational attainment (Kiernan & Mensah, 2011; Bruckauf & Chzhen, 2016). From this body of literature we identified a range of factors relating to family characteristics; household socio-economic characteristics; housing and the environment; parental well-being and parent-child relationships. We discuss these further below. In addition we included a selection of child-reported variables in our analysis (the rationale for selection is explained below) and several factual control variables based on previous research findings on child SWB in the UK. A brief description of the variables included in the analysis is as follows. For brevity, weighted distributions for each variable are provided in the tables in the analysis section. Most variables were ordinal or categorical and in these instances response options with very small percentages have been merged for analysis purposes.

**Control variables:** Four control variables were included in all multivariate analysis – the gender of the child, the age of the child in months at the time of the interview, the ethnicity of the child and the country within the UK in which the household lived at the time of the interview.

**Family characteristics (parent-reported):**

- The number of parents (one or two)
- The total number of other children under the age of 18 in the household.

**Socio-economic variables (parent-reported):**

- Poverty was measured in four ways, to reflect its multidimensional nature (Bradshaw & Holmes, 2005), income (OECD-equivalised household income), receipt of welfare benefits (based on a set of four means-tested benefits), deprivation (measured through the presence or lack of five items included in the MCS questionnaire – e.g. a yearly holiday not staying with relatives) and self-assessed financial situation (a single question on how well the household is managing financially).
- A measure of parental education reflecting the highest level of educational qualifications attained by the main parent
- The employment status of the parent(s) or carer(s) in the household

**Housing and the environment (parent-reported):**

- The household's housing tenure – defined as owned, rented and other.
- Quality of housing – three variables relating to whether there was a problem with damp in the house, whether the child had their own bedroom and whether they had a quiet place to study
- The local area – two variables relating to the main parent's view as to whether the area was a good place to bring up a child and whether there were local parks and play facilities

**Parental well-being (parent-reported):**

- Parent's physical health – based on a self-rating of health status and whether the parent reported a long-standing illness
- Parent's mental health – the measure used was the Kessler score (Kessler et al., 2003) which is calculated from five questions (e.g. 'how often have you felt hopeless in the last 30 days').
- Parent's life satisfaction – a single-item ten-point scale on satisfaction with own life so far.

**Parent-child relationships (parent-reported):** There was a relative lack of information in the data set about family relationships. However we were able to identify some relevant variables about the quality and nature of the main parent's relationship with the child as follows:

- Whether the parent said that they had frequent battles with the child
- How often the parent played active games and indoor games with the child
- How often the parent talked to the child about things that are important to them
- How close the parent felt to the child
- Whether the parent engaged in a list of seven permissive parenting behaviours (e.g. did not implement a regular bedtime for the child on week days).

**Child-reported variables:** The child self-completion questionnaire included in Wave 5 of the MCS contained around 70 question items covering topics such as time use, self-esteem, friendships, bullying, money and possessions, the local area, anti-social behaviours, views of school, attitudes to moral issues and gender equality, attitudes to alcohol, usage of alcohol and cigarettes and future aspirations. This data is of limited value in exploring factors that may explain variations in child SWB for several reasons. First, it does not seem appropriate to analyse the relationships between behaviours or attitudes and SWB because the direction of causality is unclear – for example, children may not play sports or exercise because they feel unhappy or they may feel unhappy because they don't play sports or exercise. Second, some of the items do not seem sufficiently distinct from the concept of SWB. For example there are questions about liking school and feeling tired at school but it is not clear to what extent these might be regarded as aspects of SWB rather than factors which explain variation. Third, several important topics which are known to be strongly associated with SWB are omitted from the questionnaire – including the quality of family relationships and children's feelings of autonomy and choice. Nevertheless, for the purposes of this article, there is a value in conducting analysis of some child-reported variables with the main aim of comparing their strength of association with SWB relative to the parent-reported items. So we selected the following small set of variables which cover topics known from previous research to be associated with child SWB:

- How well-off children feel that their family is compared with their friends' families.
- How safe children feel in their local area
- How often children argue or fall out with friends



- How often children have been bullied

## 2.4 Analysis

The data set includes weightings which can be used to balance the sample, taking into account the over-representation of some groups, and to correct for attrition. We have used these weightings in all analysis. The total weighted sample size is 16,356 cases. Other information is also available in the data set to take into account the design of the survey (stratification and clustering) and this has been utilised in calculating the confidence intervals in Tables 4 to 6 and 7 to 11.

An initial univariate screening of each independent variable was undertaken to assess levels of missing data and to check on the distribution of responses. Where the percentages of cases in particular response categories were sparse, categories were merged. Binary dummy variables were also created for some variables for use in the later stages of analysis.

We then explored bivariate associations between each independent variable and the three dependent variables. This stage of the analysis involved chi-square tests for nominal and ordinal independent variables and t-tests for continuous independent variables. Results are presented in Table 2. Most of these associations were statistically significant at the 99% confidence threshold. This is likely to be at least partly because of the relatively large sample size (over 16,000 weighted cases) and is clearly problematic from the point of view of presenting and interpreting findings. Most of these significant associations were of very small effect size. So we have also used measures of effect size (phi for crosstab test and  $\eta^2$  for t-tests) to distinguish between associations. We use the term ‘substantive association’ to describe significant associations with an effect size greater than 0.5%. Where we refer to a ‘significant association’ this relates to a significance level of less than 0.01 but not necessarily a substantive association (this is clarified within the text as required).

The final stage of the analysis utilised logistic regressions. We chose logistic regressions because although it is common practice in economics to use linear regressions with binary dependent variables (Mood, 2010) this practice is not so defensible if the binary variable is very unevenly split (Hellevik, 2009; Powers & Xie, 2008 cited in Zheng & Land, 2012) as is the case with our variable indicating low SWB. In order to avoid cases being omitted from the analysis due to missing data for variables that made little or no contribution to the models, we first ran logistic regressions for each group of independent variables as presented above, and then included variables making a significant contribution within each group to later models combining groups. These steps are described in the next section. In the tables summarising these models a single asterisk indicates a p-value less than 0.01 and a double asterisk indicates a p-value less than 0.001. Due to space considerations we do not include tables for all of the intermediate logistic regression models, but these are available from the authors on request.

## 3 Results

We present the analysis in sections, based on the process described in the previous section.

### **3.1 Control variables**

Bivariate analysis (Table 2) indicated that there were only a few significant associations between the four control variables and the dependent variables. Age was significantly associated with life satisfaction and sadness. Unusually, older children in the sample had a lower probability of low SWB than younger children. This runs contrary to general findings about age-related declines in child SWB. It is possibly an artefact of the sampling strategy as the data was collected earlier (i.e. when the children were younger) in some of the UK countries than others and there were variations in SWB across countries. There were no significant gender differences. Children of Indian, Pakistani, Bangladeshi and Other origin were less likely to have low SWB than other groups although the differences were only marginally statistically significant for low life satisfaction. Children in Northern Ireland were less likely to have low SWB than in the other three countries, with the exception that children in Wales were least likely to report low happiness.

Logistic regressions using only the four control variables are summarised in Table 3. Children were less likely to have low life satisfaction if they were older, were of Indian, Pakistani or Bangladeshi ethnic origin and lived in Northern Ireland. The only significant variable for happiness was that children in Wales were less likely to have low happiness. Older children and those of 'other' ethnicity were less likely to have low sadness. The low pseudo- $R^2$  statistics for these models suggest that these variables did not make a strong contribution to predicting the likelihood of low SWB.

INSERT TABLES 2 AND 3 ABOUT HERE

### **3.2 Family characteristics (parent-reported)**

At a bivariate level, children living with two parents were significantly less likely to have low SWB than children living with one parent. There were less clear patterns regarding the number of other children in the household although there was some apparent tendency for children living with three or more other children to be more likely to experience low happiness and high sadness.

In logistic regressions, along with the control variables, family structure made a significant contribution to predicting low levels of all three measures of SWB.

### **3.3 Socio-economic factors (parent-reported)**

Almost all of the socio-economic variables were significantly linked with the likelihood of low SWB. Children living in poorer families and with parents who were less well-educated were more likely to have low life satisfaction, low happiness and high sadness. The situation was less clear for parental employment. In two-parent households, children had the lowest likelihood of low SWB if both parents worked and the highest likelihood if neither parent worked. There was no significant difference in rates of low SWB according to whether a lone parent worked or not.

Equivalised household income and the deprivation score were significant variables in logistic regressions for all three SWB measures, and difficulties managing financially also contributed to predicting low life satisfaction and low happiness, but not low sadness.

Parental education and employment did not make a significant contribution to any of the three models.

### **3.4 Housing and the local environment (parent-reported)**

Housing tenure was significantly associated with all three types of SWB. Children living in rented accommodation were more likely have low SWB than children living in housing owned by their parents. Children living in local areas regarded by their parents as better places to bring up a child were also less likely to have low SWB on all three measures. There were less consistently clear bivariate patterns for the other housing and local environment variables.

In the logistic regressions considering all of the above variables plus control variables, housing tenure and parents' view about the local area significantly contributed to all three models. Whether the child had a place to do homework also contributed significantly to predicting low life satisfaction and low happiness; and whether there were local parks to predicting low happiness.

### **3.5 Parental well-being (parent-reported)**

All four measures of parental well-being were significantly related with all three measures of child SWB. Higher parental well-being was associated with a lower likelihood of low SWB.

In the logistic regression, there were some differences according to the dependent SWB measure. Whether the main parent had a longstanding illness did not make a significant contribution to any of the models when considered alongside the other three parental well-being variables and the control variables. The Kessler score (parental depression) contributed significantly to all three models; while parental general health contributed to predicting low life satisfaction and high sadness; and parental life satisfaction contributed to predicting low life satisfaction and low happiness.

### **3.6 Parent-child relationships (parent-reported)**

In almost all cases, better quality parent-reported parent-child relationships were also significantly associated with a lower likelihood of low child SWB, although the associations were weaker and sometimes non-significant for child sadness.

In the logistic regressions, three variables – frequency of battles with the child, closeness to the child and levels of permissive parenting – made significant contributions in all three models. Frequency of playing active games with the child only contributed to predicting high sadness and frequency of playing indoor games did not make a significant contribution to any of the three models.

### **3.7 Combined models based on parent-reported variables**

For each dependent variable, combined logistic regression models were then run, using the control variables and all independent variables that had made a significant contribution in as identified above. The results are summarised in Tables 5 to 7.

Children had lower odds of low life satisfaction (Model 1a) if:

- their parents assessed the household financial situation more positively

- they lived with two (rather than one) parents
- they had a place to study at home
- their main parent had better mental health
- there were not frequent battles between the parent and the child
- their main parent felt closer to them

Children had lower odds of low happiness (Model 1b) if:

- the households had lower levels of deprivation
- they had a place to study at home
- their main parent had higher life satisfaction
- there were not frequent battles between the parent and the child
- their main parent felt closer to them
- their parent reported only one or no permissive parenting behaviours

Children had lower odds of high sadness (Model 1c) if:

- the households had lower levels of deprivation
- their main parent had better physical health
- their main parent had better mental health
- there were not frequent battles between the parent and the child

All three models had Cox and Snell  $R^2$  statistics between 1% and 3%. While this is not equivalent to a linear regression  $R^2$ , the size of these statistics does not suggest that parent-reported variables have a particularly substantial power in predicting low child SWB.

INSERT TABLES 5 TO TABLE 7 ABOUT HERE

There were both similarities and differences in these three models. In all three cases, measures of household economic situation, parental well-being and parent-child relationships were important factors. However, a key difference was in the indicators of parental well-being that made a contribution to each model. Parental mental health contributed to explaining life satisfaction and sadness but not happiness; parental physical health also contributed to explaining sadness; while parental life satisfaction was the variable that made a significant contribution to explaining happiness. This raises questions, for example, about why poor parental health should increase the likelihood of children feeling sad but not affect their life satisfaction or happiness in the same way.

### **3.8 Child-reported variables**

As discussed earlier, as a means of comparison with the explanatory power of the parent-reported variables, we tested the associations between a selection of child-reported variables and the three dependent variables.

Distributions of each of these variables and bivariate associations with the dependent variables are shown in Table 7. All four variables are substantively associated with each of

the three dependent variables. In fact some of the effect sizes here are larger than any seen in the analysis of parent-reported variables. The effect size for bullying is particularly strong (relative to other variables analysed in this paper) with phi coefficients ranging from 0.19 for life satisfaction to 0.27 for sadness. This is reflected in Table 7 where the proportion of children bullied most days who report high sadness is nine times that for children who say they are never bullied. These findings are in line with other research in the UK on the strong associations between experiences of being bullied and SWB (The Children's Society, 2012). Another interesting aspect in Table 7 is that children who feel their families have 'about the same' amount of money as their friends' families are the least likely to have low SWB. Children who felt their families were poorer were the most likely to have low SWB, but children who felt their families were richer also had higher percentages of low SWB than the 'about the same' group. This also supports previous findings in the UK (The Children's Society, 2012) and is an interesting pattern that warrants further exploration.

INSERT TABLE 7 ABOUT HERE

Table 8 shows the results of logistic regressions for each of the three independent variables with control and child-reported variables. For this purpose two of the child-reported variables were converted into sets of dummy variables – family wealth because the scale was clearly not ordinal, and feeling safe in the local area because of the very small proportion of cases in the 'not at all safe' category. All four child-reported variables make a significant contribution to the model, although for happiness and sadness there was no significant difference between children who felt 'very' and 'quite' safe in their local area; and for sadness there was no difference between the 'about the same' and 'richer' categories for family wealth.

Based on the Wald coefficients the bullying variable makes the strongest contribution to each model and its contribution to the sadness model is particularly marked. A comparison of the 99% confidence intervals for the odds ratios for bullying across the three models suggests that bullying is more strongly associated with sadness than with life satisfaction or happiness. This is supported by a test (paired.r test in the 'psych' package in R) of the relative strengths of the bivariate correlations between the bullying variable and each of the SWB variable which indicates a significantly stronger association with bullying for sadness than for life satisfaction or happiness.

INSERT TABLE 8 ABOUT HERE

### **3.9 Models combining parent-reported and child-reported variables**

Finally, for exploratory purposes, we have estimated logistic regression models for each independent variables using control variables, child-reported variables and all parent-reported variables that emerged as statistically significant in the combined models discussed in section 4.7. The results are shown in Tables 9 to 11. In each model, some of the parent-reported variables still make a statistically significant contribution to the model once the child-reported variables are introduced while some do not. The parent-reported variables that remain significant include at least one measure of parental well-being and of parent-child relationships in each case, and a measure of family economic status for life satisfaction and sadness. All four child-reported variables make a significant contribution in each model with the exception of frequency of conflict with friends for life satisfaction.

INSERT TABLES 9 TO 11 ABOUT HERE

It should be noted that it is possible that some or all of the parent-reported variables may exert an indirect influence on child SWB, being mediated through the child-reported variables. This is particularly likely in the case of the child-reported variable about comparative wealth which may well mediate the effect of parent-reported household economic variables on child SWB.

### **3.10 Comparing models with parent- and child-reported variables**

We were interested to make some comparisons between the relative explanatory power of parent-reported and child-reported variables in predicting SWB. It is not possible to do this using logistic regression. Therefore for exploratory purposes we chose to run Models 1 and 2 using linear regression using binary variables. As discussed in Section 2.4 this is a relatively common practice in economics and there is evidence that it is a reasonable approach where the sample size is large and the binary variable is not very unevenly split (Hellevik, 2009). For each SWB variable we ran three linear regressions for each of Models 1 and 2. These used (a) the low/high binary SWB variable as used in all of the above analysis; (b) a more evenly split binary variable; and (c) the original variable (as shown in Table 1) treated as a scale. Results are shown in Table 12. In all cases the pattern of the results was the same – the explanatory power of Model 2 with control and child-reported variables (as in Table 8) was much stronger than the explanatory power of Model 1 with control and parent-reported variables (as in Tables 5 to 7). The larger explanatory power of the child-reported variables for sadness is particularly notable.

INSERT TABLE 12 ABOUT HERE

## **4 Discussion**

### **4.1 Key messages and implications**

This is, as far as we are aware, one of the first analyses of the relationships between children's SWB and parent-reported variables of a wide range of factors relevant to children's lives. Previous research on the determinants of child SWB in the UK (Goswami, 2014) and other European countries (Klocke et al., 2014) has found that socio-demographic factors only explain relatively small amounts of the variation in individual children's SWB. However, these analyses relied solely on child-reported data. There are important issues such as household income, parental mental health, parental education that children are not able to provide reliable information about, and so the number of socio-demographic variables in these studies has been relatively limited. There has therefore been a concern that the lack of explanatory power may be due to unmeasured factors.

The current analysis has been able to overcome this concern by linking indicators of child SWB with a very extensive set of parent-reported information from a large-scale and well-designed UK cohort study. There are three broad messages from the analysis presented in this article.

First, a wide range of parent-reported variables relating to family characteristics, the socio-economic situation of the household; the quality of housing and the local area; parental well-

being; and parental perceptions of parent-child relationships explain relatively little of the likelihood of a child experiencing low SWB.

Second, in comparison, a relatively small selection of child-reported variables – perceptions of family prosperity, conflict with friends, safety of the local area and most importantly frequency of being bullied – explain more variation than the much wider range of parent-reported information.

Additionally, there is some tentative evidence from the bivariate associations and some of the results of multivariate analysis that there may be differences in the factors associated with different components of SWB.

These three broad messages have a number of implications for the study of children's SWB.

The finding about the relatively low explanatory power of parent-reported variables is an important one because very little previous research has been able to make use of data reported by parents to analyse links with child SWB. The absence of such analysis has been considered a possible reason for the limited success of cross-sectional analysis in explaining variations in child SWB. Our findings suggest that parent-reported variables are unlikely to hold the key to explaining variations in child SWB. In fact they seem relatively unimportant compared to information reported by children themselves. Some caution is needed here because there are gaps in the information available from parents in this data set. In particular the variables used to assess the parent's view of the parent-child relationship are quite limited. However, this particular gap may not be that crucial as it can be argued that the child's opinion on the quality of their relationship with parents is rather more salient to understanding their SWB than the parent's opinion.

Nevertheless, some of the parent-reported information does make a statistically significant contribution to explaining the likelihood of a child having low well-being, even when control and child-reported variables are taken into account. In particular, measures of household deprivation and/or parent-assessed financial strain (but not income); one or more measures of parent well-being; and one or more measures of the parent's evaluation of their relationship with the child emerge as significant in all combined models with and without child-reported variables. It is important to consider further how these relationships may come about as there does seem to be some background impact of socio-economic factors on child SWB, and also because some of the parent-reported factors reported may indirectly influence child SWB through the child-reported factors. For example, if children who live in poorer families are more likely to be bullied then poverty may still play an important role in explaining the strong association that emerges in this and previous research between children's experiences of being bullied and their SWB. Thus the pathways between the various parent-reported factors considered in this analysis and child SWB are likely to be complex and multi-faceted.

The relative strength of child-reported variables in explaining variations in SWB is another important outcome of this analysis. All four child-reported factors considered made significant contributions to the model, even when the numerous factors reported by parents were taken into account. Of particular note is the finding of the relatively strong association between frequency of being bullied and SWB. Klocke et al. (2014) found similar results in their analysis of SWB using the HBSC. Bullying rates vary between countries and within

countries and over time. Bullying in the UK has been falling (Bradshaw, 2011). If bullying was eradicated it could do more than any other single factor considered in this analysis to improve the SWB of children, all other things being equal.

Our finding of potentially different patterns of association between the independent variables and measures of the different components of SWB is an important one. The analysis suggests that the things that lead to children feeling sad or happy or satisfied with life may not be altogether the same. Again, this is a contribution to relatively small body of evidence on this issue but our conclusions here must be very tentative because the nature of the SWB variables at our disposal limited the ways in which we were able to explore this issue. This is a topic for future exploration with better SWB variables.

#### **4.2 Strengths and limitations**

This analysis has made use of a large and high quality data set relating to children aged around 11 years in the UK. The data set consists of over 13,000 cases (unweighted) and weighting coefficients are available to take account the survey design and sample attrition so that the weighted data can be argued to be a representative of sample of children within the target population. The Millennium Cohort Study is a well-managed study, carried out with substantial funding, and with attention to high standards of all aspect of the research process.

However a number of limitations of our analysis should be noted.

Inevitably secondary analysis such as this is limited to the variables available in the survey data. While these variables cover a very wide range of topics there are some notable gaps, some of which have already been discussed, which mean that our analysis cannot be regarded as representing a complete picture of children's lives. This is particularly true of the child-reported data which does not cover several aspects of children's lives such as experiences of material deprivation and the extent of choice and autonomy they have which have been shown to be important factors in understanding child SWB.

In addition the variables available to represent SWB are far from ideal. The response scales are relatively short (only five or seven options) and we felt that it was necessary to take the decision only to utilise binary variables based on single questions. It is not possible to know whether much stronger associations would have been found if we had been able to use well-formulated multi-item scales to represent each SWB component.

Our research is also limited to one age group and a specific geographical area. Given the evidence of variations in SWB with age and of international variations in SWB we cannot assume that the findings are generalisable to other age groups or countries.

#### **4.3 Directions for future research**

In view of the above discussion and the relative importance of a limited selection of child-reported variables in the final models presented in the analysis, it seems that the search for explanations of individual variations in children's SWB should continue to focus primarily on information reported by children themselves. There are two substantive matters to be resolved with this type of analysis.



The first is to clarify the extent to which child-reported ‘independent’ variables used to explain variations in SWB are not in fact components of the well-being concept. For example it is possible to explain more than 50% of the variation in children’s life satisfaction in the UK by using, as independent variables, their satisfaction with various aspects of life (Rees et al., 2010b). This kind of analysis is useful for understanding the relative contribution of satisfaction with different aspects of life to overall life satisfaction, but these variables cannot really be regarded as standing outside the concept of SWB. At the other end of the subjective-objective continuum, information reported by children such as household composition clearly lie outside the SWB concept. But factors such as this have been shown to have only very weak explanatory power in terms of SWB. For example, (Rees et al., 2010a) found that, in the UK, family structure explained only around 2% of the variation in life satisfaction of young people aged 12 to 15. This result is supported by our analysis of parent-reported information in this article with a slightly younger age group. In between these two extremes, variables such as children’s reports of the level of family harmony/conflict have been found to have considerable potential explanatory power. In the above-cited research, responses (on a five-point agree-disagree response scale) to the statement ‘*My family gets along well together*’ explained around 20% of the variation in children’s life satisfaction.

So, a key issue for researchers on child SWB is to establish the boundaries of the concept. For example are children’s (subjective) responses to questions about their family relationships a component of their SWB or not? This may not be easily resolved. A number of questions (including the one cited above) about the quality of family relationships appear in a widely-used multi-dimensional scale of child life satisfaction (Huebner, 1994). If these questions are part of the SWB measure this precludes their being used as an explanation for variations in life satisfaction. However, if such questions lie outside the SWB concept then it is possible to explain very substantial proportions of the variation in child life satisfaction using them and the conclusion that we are not able to explain very much of this variation is no longer true. At face value it seems strange to argue that family conflict is not a permissible predictor of child SWB as the negative impact on child outcomes of living in high-conflict environments is well-established (e.g. Musick and Meier, 2010; Reynolds et al., 2014). Therefore the question seems to be whether the child’s evaluation of factors such as this is sufficiently valid and separate from their feelings about their life as whole.

This leads on to a second critical matter, which is to undertake research which clarifies the directions of causality between child SWB and other child-reported information. In the analysis above we treated several child-reported variables as independent predictors of low SWB, but an assumption of causality here is unwarranted. Being bullied may cause low SWB but it is also possible that children who have low SWB may be more likely to be bullied. Conflict with family or friends may also cause children to have low SWB but it is also possible that children with low SWB are likely to have more conflict with family or friends. There is therefore a pressing need for the creation and analysis of longitudinal data which facilitates an unpicking of the various processes at play.

As noted above, in addition to these two key points, future research should also aim to include measures of both cognitive and affective SWB in order to gain a full understanding of the impact of different factors on children’s feelings about their lives.

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**Table 1: Distributions and descriptive statistics for dependent SWB variables**

Life satisfaction		Happiness		Sadness
Distribution				
1 = Completely happy	52.1%	Never	1.8%	27.4%
2	25.4%	Almost never	3.4%	39.6%
3	10.1%	Sometimes	12.0%	25.7%
4	5.7%	Often	28.3%	6.1%
5	2.5%	Almost always	54.5%	1.2%
6	1.8%			
7 = Not at all happy	2.4%			
Total valid	100.0%		100.0%	100.0%
Descriptive statistics				
N valid (weighted)	15,753	N valid (weighted)	15,632	14,877
N and % missing	603 (3.7%)	N and % missing	664 (4.3%)	731 (4.7%)
Mean	8.42	Mean	8.25	7.15
Std. Deviation	2.32	Std. Deviation	2.34	2.32
Skewness	-1.868	Skewness	-1.421	-0.529
Kurtosis	3.312	Kurtosis	1.728	-0.133
% low score	12.4%	% low score	17.2%	7.3%

Total weighted sample = 16,356 cases

**Table 2: Bivariate associations of independent and dependent variables**

Variable		% of sample	Low life satisfaction	Low happiness	High sadness
Gender			ns	ns	ns
	Female	48.9%	12.8%	17.8%	7.6%
	Male	51.1%	12.1%	16.6%	7.0%
Age last birthday (I)			**	ns	**
	10	33.8%	13.5%	18.1%	7.6%
	11	65.7%	11.9%	16.8%	7.1%
	12	.4%	-	-	-
Ethnicity			*	ns	ns
	White	84.8%	12.7%	17.3%	7.3%
	Mixed	3.5%	12.0%	18.7%	7.3%
	Indian	2.0%	8.0%	13.3%	5.5%
	Pakistani and Bangladeshi	4.9%	8.8%	15.4%	8.5%
	Black or Black British	3.4%	14.6%	20.2%	8.6%
	Other	1.4%	10.3%	13.2%	2.2%
Country (at Wave 5)			ns	*	ns
	England	82.4%	12.7%	17.7%	7.5%
	Wales	4.9%	12.1%	13.9%	7.6%
	Scotland	8.7%	11.6%	16.0%	6.2%
	N. Ireland	4.0%	9.0%	14.7%	5.3%
Number of parents			***	***	**
	One	73.3%	10.8%	16.0%	6.6%
	Two	26.7%	17.0%	20.9%	9.4%
Number of other children in house			ns	**	**
	0	11.9%	13.2%	16.1%	7.2%
	1	42.7%	11.8%	16.1%	6.4%
	2	27.5%	12.2%	17.6%	7.1%
	3 or more	17.9%	13.9%	20.0%	9.7%
Age of parent at birth of child			***	***	***
	Under 21	13.9%	16.2%	20.5%	9.6%
	21 to 25	19.3%	13.0%	16.3%	7.6%
	26 to 30	30.2%	11.6%	16.6%	6.8%
	31 to 34	25.4%	11.0%	16.4%	6.7%
	35 and over	11.4%	12.1%	17.0%	6.2%

Variable	% of sample	Low life satisfaction	Low happiness	High sadness
Income		***	***	***
Lowest quintile	21.8%	14.7%	20.6%	9.7%
Second quintile	21.6%	14.5%	19.5%	8.7%
Third quintile	19.5%	13.5%	15.6%	7.6%
Fourth quintile	18.7%	9.6%	15.0%	5.6%
Highest quintile	18.4%	9.2%	14.7%	4.3%
On benefits		***	***	***
No	60.3%	10.6%	15.3%	5.9%
Yes	39.7%	15.4%	20.2%	9.4%
Self-rated financial status		***	***	**
...living comfortably,	17.8%	8.0%	13.2%	5.4%
doing alright,	33.0%	11.6%	17.7%	7.3%
just about getting by,	32.8%	14.7%	17.6%	8.1%
finding it quite difficult,	11.6%	14.4%	19.7%	7.8%
or, finding it very difficult?	4.8%	15.2%	20.8%	8.7%
Deprivation score		***	***	***
None	36.3%	9.8%	14.2%	5.3%
One	25.3%	11.5%	16.7%	7.2%
Two	20.6%	15.0%	19.4%	10.0%
Three	12.6%	15.6%	21.9%	8.5%
Four or five	5.1%	18.6%	22.2%	8.6%
Parental education		***	***	***
NVQ level 1	7.4%	16.1%	23.3%	10.7%
NVQ level 2	25.7%	12.8%	17.3%	7.7%
NVQ level 3	15.0%	12.7%	15.8%	7.0%
NVQ level 4	29.3%	11.1%	16.4%	6.3%
NVQ level 5	8.1%	9.1%	14.6%	4.4%
Overseas qualification only	3.1%	11.0%	19.5%	9.4%
None of these	11.3%	14.9%	18.7%	8.9%
Employment, two-parent families		*	***	***
Two parents, both in work	46.5%	10.1%	14.6%	5.6%
Two parents, one in work	20.7%	11.8%	18.0%	7.8%
Two parents, neither in work	6.1%	13.2%	20.2%	10.0%
Employment, one-parent families		ns	ns	ns
One parent , in work	14.8%	16.9%	19.5%	8.6%
One parent, not in work	11.9%	17.2%	22.5%	10.3%

Variable	% of sample	Low life satisfaction	Low happiness	High sadness
Housing tenure		***	***	***
Owned	58.2%	10.2%	15.3%	5.9%
Rented	39.4%	15.8%	20.1%	9.5%
Other	2.4%	13.2%	17.0%	8.3%
Housing – problem with damp		**	**	ns
No	89.6%	12.2%	16.7%	7.2%
Yes	10.4%	15.1%	21.7%	8.4%
Child has own bedroom		ns	**	*
No	28.5%	13.0%	19.8%	8.3%
Yes	71.5%	12.3%	16.2%	7.0%
Child has quiet place to study		**	***	ns
No	4.9%	19.1%	28.1%	9.5%
Yes	95.1%	12.2%	16.7%	7.3%
Good place to bring up a child		***	***	***
Excellent	34.8%	9.6%	15.4%	5.9%
Good	41.5%	13.0%	17.0%	7.6%
Average	17.9%	16.0%	18.4%	8.3%
Poor	4.4%	16.0%	28.4%	12.7%
Very poor	1.4%	14.0%	20.2%	9.3%
Local area – parks, places to play		ns	*	ns
No	6.8%	12.2%	21.0%	9.1%
Yes	93.2%	12.5%	17.0%	7.2%
Parental general health		***	**	***
... excellent,	25.3%	9.3%	15.4%	5.7%
very good	33.4%	11.9%	16.3%	6.8%
good,	27.9%	14.4%	18.5%	7.8%
fair,	9.6%	17.7%	20.4%	10.8%
or poor?	3.8%	12.4%	20.3%	10.3%
Parental long-standing illness		**	**	**
No	79.8%	11.7%	16.6%	6.7%
Yes	20.3%	15.6%	19.7%	9.6%
Parent mental health problems (I)		***	***	***
Low	71.7%	10.9%	15.3%	6.3%
Mild to moderate	22.9%	15.6%	21.7%	9.7%
Severe	5.3%	18.5%	21.5%	11.3%
Parental life satisfaction (I)		***	***	**
Low	14.2%	11.5%	15.9%	6.9%
High	85.8%	17.9%	24.0%	9.6%



Variable	% of sample	Low life satisfaction	Low happiness	High sadness
Frequent battles with child		***	***	***
Yes	29.4%	16.6%	21.9%	9.8%
No	70.6%	10.5%	15.1%	6.3%
Frequency of playing active games with child		*	**	*
Not at all	25.3%	14.0%	18.7%	8.7%
Less than once a month	21.0%	12.4%	18.7%	7.3%
Once or twice a month	22.3%	12.5%	15.7%	6.6%
Once or twice a week	21.9%	11.0%	15.2%	6.3%
Several times a week or more	9.2%	11.8%	17.8%	7.5%
Frequency of playing indoor games with child		*	**	ns
Not at all	10.4%	15.0%	21.3%	8.4%
Less than once a month	14.6%	13.5%	16.5%	7.5%
Once or twice a month	28.1%	11.5%	16.8%	6.5%
Once or twice a week	31.8%	12.0%	15.8%	7.4%
Several times a week or more	15.1%	12.6%	18.7%	7.9%
Frequency talks to child about things that are important to them		**	**	ns
Less than once a week	3.5%	19.4%	24.5%	8.7%
Once or twice a week	10.0%	12.8%	16.8%	8.5%
Several times a week	21.9%	11.7%	18.2%	7.3%
Every day or almost every day	64.6%	12.3%	16.5%	7.1%
Closeness to child		***	***	**
Not very / Fairly close	6.9%	19.8%	27.1%	11.6%
Very close	34.3%	13.1%	18.6%	7.5%
Extremely close	58.8%	11.2%	15.1%	6.8%
Permissive parenting behaviours		***	***	**
None	65.2%	11.5%	16.3%	6.8%
One	22.6%	13.0%	17.0%	7.8%
More than one	12.2%	16.8%	22.8%	9.3%

**Table 3: Control variables: Logistic regressions (Model 0) – odds ratios and levels of significance**

Variable	Low life satisfaction	Low happiness	High sadness
Gender			
Female (ref)	1.000	1.000	1.000
Male	0.934	0.919	0.912
Age at interview (months) (I)	0.971**	0.990	0.968**
Ethnicity			
White (ref)	1.000	1.000	1.000
Mixed	0.904	1.066	0.976
Indian	0.580**	0.713	0.727
Pakistani and Bangladeshi	0.644**	0.840	1.148
Black or Black British	1.116	1.167	1.150
Other	0.749	0.696	0.271**
Country (at Wave 5)			
England (ref)	1.000	1.000	1.000
Wales	0.949	0.750**	1.049
Scotland	0.910	0.889	0.850
N. Ireland	0.639**	0.788	0.670
Pseudo R <sup>2</sup>			
Cox & Snell	0.004	0.002	0.003
Nagelkerke	0.007	0.004	0.007
Number of cases			
Unweighted	12816	12746	12665
Weighted	15753	15633	15563

**Table 4: Combined parent-reported variables: Logistic regression with low life satisfaction (Model 1a)**

			99% conf intervals	
		OR	Low	High
Number of parents	Two (ref)	1.000		
	One	1.342**	1.108	1.626
Household income quintile (equivalised)	Lowest	1.000		
	2 <sup>nd</sup> lowest	1.139	.839	1.546
	Mid	1.268	.919	1.751
	2 <sup>nd</sup> highest	.952	.673	1.344
	Highest	.978	.684	1.399
Self-rated financial status	...living comfortably (ref)	1.000		
	doing alright	1.203	.927	1.562
	just about getting by	1.344*	1.030	1.755
	finding it quite/very difficult	1.101	.778	1.557
Deprivation score	None (ref)	1.000		
	One	.961	.792	1.166
	Two	1.136	.890	1.449
	Three	1.001	.741	1.352
	Four or five	1.095	.724	1.657
Housing tenure	Owned (ref)	1.000		
	Rented	1.152	.926	1.432
	Other	1.102	.677	1.794
Child has quite place to study	No (ref)	1.000		
	Yes	.725*	.530	.992
Local area is good place to bring up child (I)		1.097	.999	1.205
Parent general health(I)		1.049	.972	1.132
Parent mental ill-health (Kessler score) (I)		1.018*	1.000	1.037
Parent life satisfaction(I)		.984	.945	1.025
Frequent battles with child	No (ref)	1.000		
	Yes	.707**	.602	.830
Closeness to child	Extremely (ref)	1.000		
	Very	1.151	.975	1.358
	Fairly / not very	1.452**	1.106	1.906
Permissive parenting behaviours	None (ref)	1.000		
	One	.949	.799	1.126
	More than one	1.194	.929	1.534

1. For brevity, the odds ratios for the control variables included in the equation are not shown.

Pseudo R<sup>2</sup> statistics:

Cox & Snell = .028

Nagelkerke = .054

N= 11,231 (unweighted), 13,812 (weighted)

**Table 5: Combined parent-reported variables: Logistic regression with low happiness (Model 1b)**

		OR	99% conf intervals	
			Low	High
Number of parents	Two (ref)	1.000		
	One	1.091	.927	1.284
Household income quintile (equivalised)	Lowest	1.000		
	2 <sup>nd</sup> lowest	1.096	.872	1.377
	Mid	.871	.688	1.103
	2 <sup>nd</sup> highest	.888	.675	1.169
	Highest	.887	.667	1.178
Self-rated financial status	...living comfortably (ref)	1.000		
	doing alright	1.216	.996	1.484
	just about getting by	1.002	.814	1.233
	finding it quite/very difficult	.924	.703	1.215
Deprivation score	None (ref)	1.000		
	One	1.112	.952	1.298
	Two	1.198	.967	1.485
	Three	1.336*	1.015	1.758
	Four or five	1.218	.865	1.714
Housing tenure	Owned (ref)	1.000		
	Rented	.925	.768	1.114
	Other	.940	.582	1.520
Child has quite place to study	No (ref)	1.000		
	Yes	.595**	.453	.781
Local area is good place to bring up child (I)		1.031	.944	1.125
Local parks and places to play	No (ref)	1.000		
	Yes	.816	.631	1.053
Parent mental ill-health (Kessler score) (I)		1.013	.995	1.030
Parent life satisfaction(I)		.950**	.918	.982
Frequent battles with child	No (ref)	1.000		
	Yes	.742**	.650	.848
Closeness to child	Extremely (ref)	1.000		
	Very	1.255**	1.068	1.474
	Fairly / not very	1.685**	1.330	2.135
Permissive parenting behaviours	None (ref)	1.000		
	One	.912	.778	1.069
	More than one	1.293**	1.041	1.606

1. For brevity, the odds ratios for the control variables included in the equation are not shown.

Pseudo R<sup>2</sup> statistics:

Cox & Snell = .028

Nagelkerke = .046

N= 11,206 (unweighted), 13,771 (weighted)

**Table 6: Combined parent-reported variables: Logistic regression with high sadness (Model 1c)**

		OR	99% conf intervals	
			Low	High
Number of parents	Two (ref)	1.000		
	One	1.155	.919	1.452
Household income quintile (equivalised)	Lowest	1.000		
	2 <sup>nd</sup> lowest	1.046	.774	1.412
	Mid	1.009	.714	1.425
	2 <sup>nd</sup> highest	.861	.576	1.288
	Highest	.678	.439	1.048
Deprivation score	None (ref)	1.000		
	One	1.139	.909	1.428
	Two	1.432**	1.069	1.920
	Three	.910	.628	1.318
	Four or five	.884	.534	1.462
Housing tenure	Owned (ref)	1.000		
	Rented	1.148	.868	1.518
	Other	1.334	.726	2.452
Local area is good place to bring up child		1.068	.943	1.210
Parent general health		1.099*	1.001	1.208
Parent mental ill-health (Kessler score)		1.023*	1.002	1.045
Frequency active games with child		.969	.889	1.036
Frequent battles with child	No (ref)	1.000		
	Yes	.692**	.560	.855
Closeness to child	Extremely (ref)	1.000		
	Very	1.074	.893	1.293
	Fairly / not very	1.460	.996	2.139
Permissive parenting behaviours	None (ref)	1.000		
	One	1.028	.996	2.139
	More than one	1.215	.867	1.703

1. For brevity, the odds ratios for the control variables included in the equation are not shown.

Pseudo R<sup>2</sup> statistics:

Cox & Snell = .020

Nagelkerke = .049

N= 11,236 (unweighted), 13,825 (weighted)

**Table 7: Child-reported variables – bivariate associations with dependent variables**

	% of sample	Low life satisfaction	Low happiness	High sadness
Family wealth compared to friends		***	***	***
Richer	8.1%	14.4%	20.5%	8.3%
Poorer	4.6%	28.3%	26.7%	14.5%
About the same	70.8%	10.5%	15.5%	6.0%
Don't know	16.5%	15.2%	20.7%	10.1%
Frequency of arguing or falling out with friends		***	***	***
Most days	5.3%	23.7%	34.5%	22.3%
At least once a week	10.1%	18.3%	22.4%	11.7%
At least once a month	19.6%	13.4%	19.9%	7.9%
Less often than once a month	37.7%	10.4%	14.4%	4.9%
Never	27.2%	9.6%	13.3%	5.5%
Feelings of safety in local area		***	***	***
Very safe	30.5%	8.2%	14.4%	5.4%
Safe	58.6%	13.3%	16.8%	7.1%
Not very safe	9.8%	19.2%	26.8%	12.6%
Not at all safe	1.2%	26.5%	31.0%	21.0%
Frequency that children hurt you or pick on you on purpose		***	***	***
Most days	7.3%	30.2%	41.7%	29.4%
About once a week	9.2%	21.0%	26.4%	14.6%
About once a month	7.1%	16.5%	21.0%	8.7%
Every few months	7.2%	12.6%	19.8%	7.4%
Less often	27.1%	11.1%	14.3%	5.2%
Never	42.1%	7.6%	11.8%	3.1%

**Table 8: Control<sup>1</sup> and child-reported variables: Logistic regressions (Model 2) – odds ratios with 99% confidence intervals and levels of significance**

Variable	Low life satisfaction	Low happiness	High sadness
Family wealth compared to friends			
About the same (ref)	1.000	1.000	1.000
Poorer	2.724** (2.062- 3.599)	1.565** (1.224- 2.002)	1.788** (1.196- 2.673)
Richer	1.292** (1.005- 1.660)	1.254** (1.015- 1.548)	1.173 (0.830- 1.657)
Don't know	1.292** (1.065- 1.568)	1.247** (1.058- 1.470)	1.452** (1.157- 1.822)
Frequency of conflict with friends (I)	1.127** (1.047- 1.213)	1.165** (1.103- 1.231)	1.201** (1.100- 1.312)
Feelings of safety in local area			
Very safe (ref)	1.000**	1.000	1.000
Quite safe	1.583** (1.312- 1.911)	1.086 (0.932- 1.264)	1.211 (0.982- 1.495)
Not very / Not at all safe	1.978** (1.526- 2.563)	1.563** (1.258- 1.943)	1.685** (1.263- 2.249)
Frequency of being bullied (I)	1.282** (1.227- 1.344)	1.276** (1.227- 1.327)	1.523** (1.444- 1.607)
Pseudo R <sup>2</sup>			
Cox & Snell	0.048	0.047	0.058
Nagelkerke	0.092	0.079	0.143
Number of cases	0.063	0.051	0.115
Unweighted	12,315	12,297	12,216
Weighted	15,104	15,060	14,995

1. For brevity, the odds ratios for the control variables included in the equation are not shown.

**Table 9: Combined parent-reported and child-reported variables: Logistic regression with low life satisfaction (Model 3a)**

			99% conf intervals	
		OR	Low	High
Number of parents	Two (ref)	1.000		
	One	1.437**	1.197	1.725
Self-rated financial status	...living comfortably (ref)	1.000		
	doing alright	1.360*	1.049	1.763
	just about getting by	1.452**	1.118	1.885
	finding it quite/very difficult	1.312	.936	1.839
Child has quite place to study	No (ref)	1.000		
	Yes	.779	.559	1.087
Parent mental ill-health (Kessler score) (I)		1.019*	1.001	1.037
Frequent battles with child	No (ref)	1.000		
	Yes	.808**	.687	.951
Closeness to child	Extremely (ref)	1.000		
	Very	1.097	.923	1.305
	Fairly / not very	1.543**	1.150	2.072
Family wealth compared to friends	About the same (ref)	1.000		
	Poorer	2.451**	1.834	3.275
	Richer	1.432**	1.076	1.906
	Don't know	1.236*	1.003	1.522
Frequency of conflict with friends		.927	.858	1.002
Feelings of safety in local area	Very safe (ref)	1.000		
	Quite safe	1.532**	1.258	1.866
	Not very / Not at all safe	1.746**	1.328	2.295
Frequency of being bullied		.781**	.746	.818

1. For brevity, the odds ratios for the control variables included in the equation are not shown.

Pseudo R<sup>2</sup> statistics:

Cox & Snell = .059

Nagelkerke = .113

N= 10,988 (unweighted), 13,508 (weighted)



**Table 10: Combined parent-reported and child-reported variables: Logistic regression with low happiness (Model 3b)**

			99% conf intervals	
		OR	Low	High
Deprivation score	None (ref)	1.000		
	One	1.080	.927	1.258
	Two	1.108	.925	1.327
	Three	1.094	.864	1.385
	Four or five	.948	.637	1.337
Child has quite place to study	No (ref)	1.000		
	Yes	.657**	.480	.898
Parent life satisfaction(I)		.944**	.916	.973
Frequent battles with child	No (ref)	1.000		
	Yes	.842*	.737	.963
Closeness to child	Extremely (ref)	1.000		
	Very	1.235**	1.046	1.457
	Fairly / not very	1.656**	1.283	2.138
Permissive parenting behaviours	None (ref)	1.000		
	One	.976	.828	1.150
	More than one	1.343**	1.073	1.680
Family wealth compared to friends	About the same (ref)	1.000		
	Poorer	1.403*	1.069	1.842
	Richer	1.228	.968	1.559
	Don't know	1.265**	1.066	1.502
Frequency of conflict with friends		.863**	.816	.913
Feelings of safety in local area	Very safe (ref)	1.000		
	Quite safe	1.059	.908	1.235
	Not very / Not at all safe	1.480**	1.158	1.892
Frequency of being bullied		.785**	.753	.818

1. For brevity, the odds ratios for the control variables included in the equation are not shown.

Pseudo  $R^2$  statistics:

Cox & Snell = .062

Nagelkerke = .105

N= 11,048 (unweighted), 13,593 (weighted)

**Table 11: Combined parent-reported and child-reported variables: Logistic regression with high sadness (Model 3c)**

			99% conf intervals	
		OR	Low	High
Deprivation score	None (ref)	1.000		
	One	1.158	.918	1.46199
	Two	1.575**	1.171	2.117
	Three	.947	.646	1.388
	Four or five	.914	.545	1.533
Parent general health		1.116*	1.012	1.231
Parent mental ill-health (Kessler score)		1.019	.996	1.041
Frequent battles with child	No (ref)	1.000		
	Yes	.796*	.640	.991
Family wealth compared to friends	About the same (ref)	1.000		
	Poorer	1.707**	1.118	2.607
	Richer	1.209	.836	1.749
	Don't know	1.433**	1.130	1.818
Frequency of conflict with friends		.833*	.755	.919
Feelings of safety in local area	Very safe (ref)	1.000		
	Quite safe	1.151	.925	1.433
	Not very / Not at all safe	1.502**	1.088	2.074
Frequency of being bullied		.658**	.622	.696

1. For brevity, the odds ratios for the control variables included in the equation are not shown.

Pseudo  $R^2$  statistics:

Cox & Snell = .068

Nagelkerke = .168

N= 10,861 (unweighted), 13,351 (weighted)

**Table 12: Adjusted R<sup>2</sup> statistics for linear regression of models with parent-reported (Model 1) and child-reported (Model 2) independent variables with alternative dependent variables**

Variable	Model 1	Model 2
Low life satisfaction (binary)	.026	.053
Life satisfaction - even split (binary) <sup>1</sup>	.033	.076
Life satisfaction (treated as scale)	.029	.076
Low happiness (binary)	.022	.051
Happiness even split (binary) <sup>2</sup>	.023	.081
Happiness (treated as scale)	.023	.062
Low sadness (binary)	.019	.071
Sadness even split (binary) <sup>3</sup>	.028	.138
Sadness (treated as scale)	.025	.172

Notes:

The aim of creating the ‘even split’ variables was to have an imbalance no greater than 80-20.

1. For life satisfaction we split the variable between scores of 1 and 2 (77.5% of weighted cases) and scores of 3 to 7 (22.5% of weighted cases)
2. For happiness we split the variable between scores of ‘Almost always’ (54.5% of weighted cases) and scores of ‘Never’ to ‘Often’ (45.5% of weighted cases)
3. For sadness we split the variable between scores of ‘Never’ and ‘Almost never’ (67.0% of weighted cases) and scores of ‘Sometimes’ to ‘Almost always’ (33.0% of weighted cases)